

IPD

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	John G. Leishman, et al.	: Group
Serial No:	10/618,645	: Art Unit #3745
Filed:	15 July 2003	: Examiner
Title:	ROTOR BLADE SYSTEM WITH REDUCED BLADE-VORTEX INTERACTION NOISE	: Unknown



SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Honorable Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The Applicants wish to make the following art references of record in the above-identified Patent Application pursuant to 37 C.F.R. §§ 1.97 and 1.98, and to the Duty of Disclosure set forth in 37 C.F.R. § 1.56.

Although the information submitted herewith may be "material" to the Examiner's consideration of the subject Patent Application, this submission is not intended to constitute an admission that such information is "prior art" as to the claimed invention.

In accordance with 37 C.F.R. § 1.97(g), the filing of this Supplemental Information Disclosure Statement shall not be construed to mean that a search was made or that no other material information, as defined in 37 C.F.R. § 1.56(b), exists.

Cited Publications are:

<u>Ref. No.</u>	<u>Description</u>
AA	Leishman, J.G., and Bagai, A., "Challenges in Understanding the Vortex Dynamics of Helicopter Rotor Wakes," <i>AIAA Journal</i> , Vol. 36, No. 7, July 1998, pp. 1130-1140.
AB	Leishman, J.G., <i>Principles of Helicopter Aerodynamics</i> , Cambridge University Press, 2000, Chapter 10.
AC	Schmitz, F.H., "Rotor Noise," Chapter 2, <i>Aeroacoustics of Flight Vehicles: Theory and Practice</i> , Vol. 1, NASA Reference Publication 1258, Aug. 1991.
AD	Berry, J.D., and Mineck, R.E., "Wind Tunnel Test for an Articulated Helicopter Rotor Model with Several Tip Shapes," NASA-TM-80080, December, 1980.
AE	Martin, P.B. and Leishman, J.G., "Trailing Vortex Measurements in the Wake of a Hovering Rotor Blade with Various Tip Shapes," Proceedings of the 58 th Annual Forum of the American Helicopter Society International, Montréal Canada, June 11-13, 2002.
AF	Tangler, J.L., "Experimental Investigation of the Sub-wing Tip and Its Vortex Structure," NASA CR-3058, 1978.
AG	Marchman, J.F. III, and Uzel, J.N., "Effect of Several Wing Tip Modifications on a Trailing Vortex," <i>Journal of Aircraft</i> , Vol. 9, No. 9, 1972, pp. 684-686.
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AI	Kantha, H.L., Lewellen, W.S., and Durgin, F.H., "Response of a Trailing Vortex to Axial Injection into the Core," <i>Journal of Aircraft</i> , Vol. 9, No. 3, 1972, pp. 254-256.

- AJ Liu, Z., Russel, J.W. and Sankar, L.N., "A study of Rotor Tip Structure Alteration Technique," *Journal of Aircraft*, Vol. 38, No. 3, 2001, pp. 473-477.
- AK Han, Y.O., and Bae, H., "Modification of the Tip Vortex by Span-wise Slots," *KSAS Korean Journal*, Vol. 27, No. 5, 1998, pp. 1-7.
- AL Han, Y.O., and Chung, W.J., "Mean and Turbulent Characteristics of Tip Vortices Generated by a Slotted Model Blade," Proceedings of 5th Engineering Turbulence Modeling and Measurements, Malloca, Spain, 2002, pp. 637-646.
- AM Martin, P.B., Bhagwat, M.J., and Leishman, J.G., "Strobed Laser-Sheet Visualization of a Helicopter Rotor Wake," 2nd Pacific Symposium on Flow Visualization and Image Processing, Honolulu, Hawaii, 1999.
- AN Bhagwat, M.J., and Leishman, J.G., "Stability Analysis of Rotor Wakes in Axial Flight," *Journal of the American Helicopter Society*, Vol. 45, No. 3, 2000, pp. 165-178.
- AO Leishman, J.G., "Seed Particle Dynamics in Tip Vortex Flow," *Journal of Aircraft*, Vol. 33, No. 4, 1996, pp. 823-825.
- AP Martin, P.B., Pugliese, G.J., and Leishman, J.G., "Laser Doppler Velocimetry Uncertainty Analysis For Rotor Blade Tip Vortex Measurements," AIAA CP 2000-0263, 38th Aerospace Sciences Meeting and Exhibit, Reno, NV, 2000.
- AQ Barrett, R.V., and Swales, C., "Realisation of the Full Potential of the Laser Doppler Anemometer in the Analysis of Complex Flows," *Aeronautical Journal*, Vol. 102, No. 10, 1998, pp. 313-320.
- AR Tung, C., Caradonna, F.X., and Morse, H.A., "The Structure of Trailing Vortices Generated by Model Rotor Blades," *Vertica*, Vol. 7, 1983, pp. 33-43.
- AS Tennekes, H, and Lumley, J.L., *A First Course in Turbulence*, MIT Press, 1972.

- AT Vatistas, G.H., Kozel, V., and Mih, W.C., "Simpler Model for Concentrated Vortices," *Experiments in Fluids*, Vol. 24, No. 11, 1991, pp. 73-76.
- AU Lamb, H., *Hydrodynamics*, 6th Ed. Cambridge University Press, Cambridge, UK, 1932.
- AV Oseen, C.W., "Über Wirbelbewegung in Einer Reiben den Flüssigkeit," *Ark. J. Mat. Astrom. Fys.*, Vol. 7, 1912, pp. 14-21.
- AW Bhagwat, M.J., and Leishman, J.G., "Viscous Vortex Core Models for Free-Vortex Wake Calculations," Proceedings of the 58th Annual Forum of the American Helicopter Society International, Montréal Canada, June 11-13, 2002.
- AX Bhagwat, M.J., and Leishman, J.G., "Correlation of Helicopter Rotor Tip Vortex Measurements," *AIAA Journal*, Vol. 38, No. 2, 2000, pp. 301-308.
- AY Squire, H.B., "The Growth of a Vortex in Turbulent Flow," *The Aeronautical Quarterly*, August 1965, pp. 302-305.
- AZ Cotel, A.J., and Breidenthal, R.E., "Turbulence Inside a Vortex," *Physics of Fluids*, Vol. 11, No. 10, 1999, pp. 3026-3029.
- BA Bradshaw, P., "The analogy Between Streamline Curvature and Bouyancy in Turbulent Shear Flows," *Journal of Fluid Mechanics*, Vol. 36, Part 1, pp. 177-191.
- BB Iverson, J.D., "Correlation of Turbulent Trailing Vortex Decay Data," *Journal of Aircraft*, Vol. 13, No. 3, 1976, pp. 338-342.
- BC Devenport, W.J., Rife, M.C., Liapis, S.I., and Follin, G.J., "The Structure and Development of a Wing-Tip Vortex," *Journal of Fluid Mechanics*, Vol. 312, 1996, pp. 67-106.
- BD Leishman, J.G., "Measurements of the Aperiodic Wake of a hovering Rotor," *Experiments in Fluids*, Vol. 25, 1998, pp. 352-361.

MR2833-27

Serial Number: 10/618-645

BE Gursul, I., and Xie, W., "Origin of Vortex Wandering Over Delta Wings,"
Journal of Aircraft, Vol. 37, No. 2, 1999, pp. 348-350.

This Supplemental Information Disclosure Statement is being filed more than three months subsequent to the Filing Date of the subject Patent Application, but before the mailing of a first Office Action.

A Form PTO-1449 and copies of the references are submitted along with this document. It is requested that the Examiner consider the references and make them of record in the above-referenced Patent Application.

Respectfully submitted,
FOR: ROSENBERG, KLEIN & LEE



David I. Klein
Registration #33,253

Dated: 20 Aug. 2004

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Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known

Application Number	10/618,645
Filing Date	15 JULY 2003
First Named Inventor	JOHN G. LEISHMAN
Art Unit	3745
Examiner Name	UNKNOWN
Attorney Docket Number	MR2833-27

Sheet 1 of 4

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
	AA	Leishman, J.G., and Bagai, A., "Challenges in Understanding the Vortex Dynamics of Helicopter Rotor Wakes," AIAA Journal, Vol. 36, No. 7, July 1998, pp. 1130-1140.	
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Examiner
Signature

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Considered

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Substitute for form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>		Complete if Known	
		Application Number	10/618,645
		Filing Date	15 JULY 2003
		First Named Inventor	JOHN G. LEISHMAN
		Art Unit	3745
		Examiner Name	UNKNOWN
Sheet 2	of 4	Attorney Docket Number MR2833-27	

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	AK	Han, Y.O., and Bae, H., "Modification of the Tip Vortex by Span-wise Slots," KSAS Korean Journal, Vol. 27, No. 5, 1998, pp. 1-7.	✓
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	AQ	Barrett, R.V., and Swales, C., "Realisation of the Full Potential of the Laser Doppler Anemometer in the Analysis of Complex Flows," Aeronautical Journal, Vol. 102, No. 1	✓
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	AS	Tennekes, H, and Lumley, J.L., A First Course in Turbulence, MIT Press, 1972.	✓
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Examiner Signature		Date Considered	
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	AU	Lamb, H., Hydrodynamics, 6th Ed. Cambridge University Press, Cambridge, UK, 1932.	
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